OBSERVATIONS

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ON

A CASE

OF

STRABISMUS DIVERGENS,

OR

Squinting,

WHICH WAS CURED IN

AN ADULT SUBJECT,

AFFECTED WITH IT FROM HIS INFANCY.

BY

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OBSERVATIONS

ON A

CASE OF STRABISMUS DIVERGENS

OF

THE RIGHT EYE,

WHICH WAS CURED IN AN ADULT SUBJECT AFFECTED WITH IT FROM HIS INFANCY.

SOME time ago, whilst seeking a relaxation from my more serious avocations, my attention was attracted by the charms which Buffon has diffused throughout his works; and I read over again his history of man, in which one scarcely knows whether most to admire, the strength of his reasoning, or the magnificence of his style. This reading, to which I certainly gave more attention than I had before done, furnished me with the idea of an experiment, which had for its object, the cure of a divergent Strabismus of the right eye, in an adult subject; consequently at a time of life generally deemed impracticable for the cure of such a shocking deformity.

Buffon, it is well known, concludes his inquiries into the sense of Vision, by some remarks upon Strabismus, or squinting. It is likewise well known, that Strabismus, according to Buffon, arises from an original difference, either in the conformation of the two eyes, or in the degree of sensibility of the two retinæ: in a word, from an unequal degree of strength in the two eyes, and a want of susceptibility in the two organs, of being equally acted upon by external objects, so as to receive two identical impressions. This explanation of the case is more plausible than that of M. Lahire, the academician, who supposes

that the Retinæ is possessed of a more lively sensibility at that spot where the optic nerve is inserted, than in any other part of the interior of the eye: that it is at that point also where the images of objects are depicted, from which he infers, that Strabismus depends on a disagreement of the point of insertion of the two optic nerves.

I might assert, that the theory of Buffon, although more conformable to reason and experience than that of Lahire, is nevertheless too absolute and too general. In many cases indeed, Strabismus is not the consequence of any innate defect: in many persons, it is owing to a bad habit contracted in infancy. I might likewise add, (and the observation appears to me not sufficiently attended to), that supposing an equal force to exist in the two eyes, children ought to have a great propensity to contract the habit of squinting, since the harmony which should take place between the two eyes to produce a perfect sight, requires, in the lateral movements, the concurrence of the action of two opposite muscles; of the adductor on the one side, and the abductor on the opposite: now the harmony of movement ought to be much more easily established between two muscles destined to produce the same motion, as between the two elevatores oculi or the two depressores. I believe too, that no case of Strabismus was ever seen, in which, on looking either upwards or downwards, one of the eyes only was properly directed, while the other was directed the opposite way. But it is a fact observed in a case of Strabismus that I am here concerned with, and I shall avoid repeating all that has, or might be said, with regard to the origin of this deformity.

I shall, however, make one more remark; the Strabismus which arises from an original inequality of strength in the two eyes, and that which depends on

a habit which some children acquire of turning one of their eyes from the objects they look at, the consequence of an improper exposure to the light, and where both eyes were originally possessed of equal strength, differ very little from each other, when the deformity is of long standing: there exists a confusion, however, with respect to what essentially constitutes each species, as well as with respect to the possibility or impossibility of obtaining a cure, and as to the nature of the means to be employed for this purpose. In short, in that species which does not depend upon an original inequality of strength in the two eyes, that inequality at length establishes itself in consequence of the habit contracted, of turning one of the eyes from the objects looked at. The eye thus turned away becomes weak, and at the same time a predominant action establishes itself in its adductor or abductor muscle, according as the Strabismus happens to be *converging* or *diverging*; but most commonly in the abductor or right external muscle.

In the other species of Strabismus, it is the innate weakness of one of the eyes which brings on the predominant action of one of the lateral muscles of that eye which has the least strength. In this case, the predominance of the action of the adductor or abductor muscle of one eye, is the effect of a greater or less disproportion in the strength of the two organs, and of a difference in the extent of the interval of the point of vision, being distinct in each of the eyes. In the other affection, on the contrary, it is the predominant action in one of the lateral muscles of one of the eyes, which is the first cause of Strabismus; of which the inequality of strength is the effect or result. Such are, in short, the two elements, or if you will, the two essential phenomena observable in the two most common species of Strabismus. It is without doubt of little consequence after a certain time, which of

these two phenomena has given birth to the other. It appears then, at least it is my opinion, that what requires most consideration in a Strabismus of a certain time standing, is less the first cause of the deformity or the manner of its production, than the inequality which at present exists in the strength of the two eyes, and the degree to which it has arrived.

It is proved, that whatever may be the first or exciting cause of Strabismus, a removal of the weakness whether congenital or acquired has sometimes been brought about, and a harmony established between the action of the muscles of the two eyes, which ought to act in concert, in order that the sight may be perfect in all the ways in which it can be exercised, and in the end the deformity in question has been cured. It is hardly necessary to observe, that it will be sufficient for this purpose, to withdraw the stronger eye for a time from the impression of the light, and to employ the weaker one exclusively, which, in general in Strabismus, notwithstanding it's relative weakness, preserves a disposition to direct itself properly towards external objects, while obliged to act alone. But it is a general opinion, that the cure of Strabismus can only be attempted in children, and I do not know whether it has been contradicted by cases of cures obtained in grown people. Without directly attacking this opinion, or asserting positively that it is as easy to cure Strabisums in advanced life as in childhood, Buffon nevertheless gives us hints of it in some of his ingenious reflections on squinting.

According to him, it is absolutely necessary, to perfect vision, that the two eyes be of equal strength. Nevertheless an inequality of strength in the two eyes does not necessarily induce squinting. If it is very slight, the consequence is that objects are perceived with the stronger eye, as distinctly as with both: whilst at the same time, admitting a perfect equality

of strength between these two organs; the sight is stronger and more extended with both of them than with only one, by about a thirteenth or a twelfth part. A little more inequality renders the objects when seen by both eyes, a little less distinct, than when seen with the stronger eye only. In fine, a still greater inequality renders the sight with the two eyes so confused, that in order to see the objects distinctly, the person is obliged to turn away the weak eye, and to place it in a situation where it cannot produce any interruption.

Suppose an inequality of strength between the two eyes, and that the boundaries of distinct vision of the stronger eye, are, for instance, for reading, eight inches and twenty inches, and consequently the extent of this distinct vision twelve inches; that is to say, that on either side of these two distances, vision is too much confused, the inequality between the two eyes ought to be at most three-tenths, in order that both the eyes may commonly concur in producing vision. If the inequality is greater, the person is obliged to turn away the weak eye in order to employ the good one alone. The degree of inequality between the two eyes, beyond which squinting necessarily takes place, is always three-tenths for all those sights, the distances of which are proportioned as that of the case just supposed. But if the distance of distinct vision be greater on both sides, the eyes being always supposed unequal in strength; and if, for example, instead of seeing distinctly with the stronger eye, at from 6 inches to 15, or from 8 to 20, or from 10 to 25, &c. The distinct vision extends from $4\frac{1}{2}$ inches to 18, or from 6 to 24, or from $7\frac{1}{2}$ to 30, &c. There must exist a greater degree of inequality of strength, in order that the weak eye be turned away and squinting take place: for all these cases there must exist an inequality of $\frac{1}{4}$. Buffon takes occasion to observe,

that children do not see at so great a distance, by something considerable, as grown up people; whilst at the same time, the same proportions being observed, they can distinctly see as near: so that the absolute space of distinct vision increases in proportion as we advance in age. For this reason, independently of some others, infants are more disposed to squint than adults, since one-tenth, or even less inequality of strength in the eyes is sufficient to induce squinting, when there is but a small interval of distinct vision, and a greater inequality is necessary, as $\frac{3}{8}$ or more, when the absolute distance of distinct vision is increased.

It was this last remark which struck me on reading over again the article of Buffon on Strabismus. If the adult man, said I, is less liable than a child to the danger of squinting from the inequality of strength between the two eyes, because this inequality must have existed to a very high degree, does it not appear probable that in an adult affected with Strabismus from his infancy, even in consequence of a congenital defect in the strength of the eyes, that experiments to effect a cure might prove even more efficacious than in a child? I was not deceived in my conjecture.

A man, in whose welfare I take the most lively interest, and who is now in his thirty-fifth year, was affected with squinting in his right eye from his most tender years. Was this Strabismus the consequence of an original difference in the strength of the eyes? Or was it the result of a bad habit contracted in his earliest years? I am utterly ignorant of it: and nothing, as may well be supposed, can fix my uncertainties on that head. Nevertheless, I presume upon the second cause rather than the first, and for this reason: the means employed for curing the Strabismus, succeeded with a degree of promptitude which far surpassed my hopes. I think it could not have

happened so if the weakness of the eye had been congenital. At least it appears reasonable, that more obstacles would have presented themselves to retard the re-establishment of the equilibrium of action between the two eyes, if the inequality of strength had been innate, than whilst it was accidental or acquired. On the other hand, in the patient cured of Strabismus, the sight was very good without having that great extent observed in some persons, and which is rather to be considered prejudicial than beneficial, since it disposes the person to be long-sighted at an age not much advanced. This circumstance makes me likewise presume, that the Strabismus was rather accidental than depending on any innate defect, because, as I have observed from Buffon, that Strabismus, from an inequality of strength in the eyes, takes place so much the more difficultly as the space of distinct vision is more extended; and *vice versa*. From which cause it happens, that Strabismus is frequently combined with shortsightedness; or that a number of individuals are at the same time shortsighted, and squint; because in consequence of the short extent of their vision, a great inequality in the strength of the eyes is not necessary to induce squinting.

Most probably then, the Strabismus of which I have effected the cure in the adult subject, was accidental, that is to say, dependant on a bad habit contracted in childhood. The inequality of the strength between the two eyes was apparently the consequence of it. Although this inequality was not great, the Strabismus was almost constant, and especially when looking at objects placed at no great distance. By a continued effort of the will, a concurrence in the direction of the two axes of the eyes, could be effected towards the same objects, and a momentary cessation of the Strabismus, but then the sight was confused, for want of a harmony of the two impressions.

For any person engaged in a profession, the success

of which depends on public confidence and opinion, and whose success rests on his own merit, such a deformity may be prejudicial, and may serve to sharpen the darts of malice. This was the case with the subject of this memoir. But this probably only stimulated him the more to labour, in order to appear with more advantage in the sphere in which he moved. However that may be, incessantly pursued with the idea that such a physical defect might be hurtful to him, and with a desire to be freed from it; anxious too to ascertain the causes of Strabismus, and the means to re-establish the harmony of action in the two eyes, he had frequently, but always without effect, put in practice these different methods. Twenty times, for instance, had he set himself to work to endeavour to force the two eyes to act together on the objects submitted to the sense of vision, or by covering up the left eye, which was the strongest, to withdraw it from the impression of the light, he endeavoured to exercise the right eye exclusively, which was the weakest. But each time he was obliged, after a few attempts to give up the project. He not only perceived from these attempts confused vision, but experienced also a great fatigue of mind, which soon became insupportable, and obliged him to give up the attempt, with the double mortification of having made an useless experiment, and sacrificed his time without any advantage. Whether he wished to read or to write, or to fix his attention upon any other object, especially an object at a small distance, and which required to be seen with precision, the squinting was always indispensably necessary to him. Knowing how important he considered it to be delivered from this deformity, I communicated to him the idea which struck me on reading Buffon, and I had no difficulty in persuading him, that his attempts had hitherto been unsuccessful, only because he had not persisted long enough in them; or because his sight had not yet ac-

quired that extent which renders the cure of Strabismus possible. He consented to make fresh efforts, with a resolution to persist in them, and to support the fatigue of mind which he had constantly experienced in his former attempts, being determined to make a sacrifice of a few days even of unsuccessful endeavour, that he might arrive at a certainty of the incurability of his situation, or be freed from his annoyance. The means he made use of did not at all differ from those he had formerly employed, and which I have just mentioned. He gave up the night to these exercises, and for several hours together continued to read, or write, alternately with the right eye only, the left being covered, and also with the two eyes together, striving to make the optic axis of each coincide towards the same point. At first the same confusion in the images of objects took place, as in the preceding attempts, and the same sensation of fatigue. However, these effects began by degrees to grow less, and a few days proved sufficient for the right eye to gain as great a degree of strength as the left, so that it could follow its movements, and a perfect harmony of action was restored. The person then in question ceased from that moment to squint, and it became impossible for him then to prevent the two eyes from acting in concert. His physiognomy has in consequence assumed a different character.

Four months have already elapsed since these changes took place, and time has confirmed the cure. I do not know what could now cause the equality of the strength of the two eyes to cease, or break the harmony of action established in the muscles destined to move them, since the Strabismus has neither been resolved, nor was kept up by any defect of either of the eyes, nothing can now point out on which side the squinting took place, it can only be known by those who were acquainted with the subject of this memoir previous to his cure. There is now no difference in

the strength of the two eyes when acting separately; the strength of the two together is now greater than that of the left eye, which was formerly the strongest. Consequently the extent of the sight, or the interval of distinct vision, is augmented. It is even, or appears to be greater than that of most men, between the force of one eye only, or of the two concurring together to produce vision; that is to say, more than one-thirteenth or one-twelfth. Thus the person in question reads, writes, or exercises his sight in any manner at a greater distance than he could formerly. Besides objects appear to him with more clearness, and above all well defined; whereas he saw them before surrounded with a kind of penumbra. They appear to him more fixed or with a less degree of mobility: all which changes, after having caused him a great degree of surprize, are become to him a source of satisfaction, which has not yet been weakened by habit.*

* Whilst I was preparing the above observations to communicate them to a learned society, from the members of which I am daily receiving marks of esteem, I thought I ought to conceal the name of the person, who, by my advice, had been so happily cured of his deformity. I still persisted in my resolution, when the same society inserted my communication in their Periodical Publication. This secret did not long continue so to the persons who knew me privately: they soon perceived, that instead of the reporter, I was the object of the report. In declaring this, I give to the relation of a fact which appears to me curious, all that force of truth, which all observations in Medicine or Surgery ought to have, especially when they are uncommon.

THE END.

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